

ENGINEERING MECHANICS

<u>Subject</u>	: Engineering Mechanics
<u>Textbook</u>	: Engineering Mechanics, 3 rd Edition by A. Higdon and W. Stiles
<u>Time</u>	: Four hours per week
<u>Lecturer</u>	: Dr. Khalid K. Shadhan

Part I : STATICS

1. Basic Concepts

- 1.1 Historical background
- 1.2 Scalar and vector quantities
- 1.3 Forces
- 1.4 Composition and resolution of forces
- 1.5 Moment of a force
- 1.6 Principles of moments
- 1.7 Couples
- 1.8 Transformation of a couple
- 1.9 Resolution of a force into a force and a couple

2. Resultant of Force System

- 2.1 Introduction
- 2.2 Resultant of a concurrent, coplanar force system
- 2.3 Resultant of a non-concurrent, coplanar force system
- 2.4 Resultant of a concurrent, non-coplanar force system
- 2.5 Resultant of a parallel, non-coplanar force system
- 2.6 Resultant of a system of couples in space

3. Equilibrium

- 3.1 Equilibrium
- 3.2 Free-body diagram
- 3.3 Equations of equilibrium for a concurrent, coplanar force system
- 3.4 Equilibrium of bodies acted on by two forces or three forces
- 3.5 Equilibrium of bodies acted on by non-concurrent, coplanar force system

4. Analysis of Structures

- 4.1 Analysis of beams
- 4.2 Analysis of frames
- 4.3 Analysis of trusses

5. Friction

- 5.1 Nature of friction
- 5.2 Laws of friction
- 5.3 Coefficient of friction
- 5.4 Angle of friction
- 5.5 Types of problems involving frictional forces

6. Centroid and Center of Gravity

- 6.1 Introduction
- 6.2 The center of gravity of a system of particles
- 6.3 The center of gravity of a body
- 6.4 Centroid
- 6.5 Centroid by integration
- 6.6 Centroid of composite areas
- 6.7 Center of pressure

7. Second Moment or Moment of Inertia

- 7.1 Definitions
- 7.2 The parallel-axis theorem for areas
- 7.3 Second moments of areas by integration
- 7.4 Radius of gyration of areas
- 7.5 Moment of inertia of composite areas

Part II : DYNAMICS

1. Kinematics-Absolute Motion

- 1.1 Rectilinear motion of a particle
- 1.2 Angular motion of a line
- 1.3 Curvilinear motion of a particle using rectangular components
- 1.4 Motion of projectiles

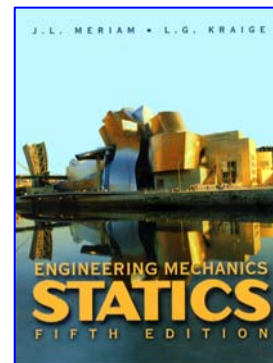
2. Kinematics-Relative Motion

Textbook

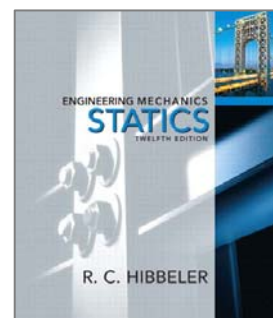
ENGINEERING MECHANICS
THIRD EDITION 2002
A. HIGDON and W.STILS

References

1. ENGINEERING MECHANICS STATICS
FIFTH EDITION 2002
J.L. MERIAM and L.G. KRAIGE



2. ENGINEERING MECHANICS STATICS
TWELFTH EDITION
R.C. HIBBELER



Marks	
15%	1 st term examination
15%	2 nd term examination
10%	Quiz
60%	Final examination